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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,087	02/07/2001	Takahiro Ishikawa	1538.1010	4567

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EXAMINER	
YIGDALL, MICHAEL J	

ART UNIT	PAPER NUMBER
2192	

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/778,087	ISHIKAWA ET AL.	
	Examiner	Art Unit	
	Michael J. Yigdall	2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/22/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 30, 2006 has been entered. Claims 1 and 3-12 are now pending.

Response to Arguments

2. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection, as set forth below with reference to Nackman. Applicant's amendment necessitated the new ground(s) of rejection.

Nonetheless, in response to Applicant's argument that Umekita does not teach or suggest the claimed method and system wherein the compiler is for "a parallel computer with shared memory" (remarks, page 8, third paragraph), Umekita indeed teaches a compiler (see, for example, parallel compiler 213 in FIG. 27) for a parallel computer with shared memory (see, for example, FIG. 28 and column 5, lines 30-37), as noted in the advisory action mailed on May 4, 2006. Again, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981), and *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

With respect to claim 4, the claim is directed to the "storage medium" of claim 1. However, claim 1 recites a "medium" rather than a storage medium. The examiner suggests amending claim 1 to recite --storage medium-- as described in Applicant's specification (see page 3), which would thus provide sufficient antecedent basis for claim 4.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 3, 5-7 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,182,281 to Nackman et al. (now made of record, "Nackman") in view of U.S. Patent No. 5,684,955 to Meyer et al. (art of record, "Meyer") in view of U.S. Patent No. 6,438,746 to Martin (art of record, "Martin").

With respect to claim 1 (currently amended), Nackman discloses a compiler embodied on a medium to compile a source program in an object-oriented programming language (see, for example, the abstract), said compiler comprising:

during generating an intermediate language from said source program (see, for example, column 4, lines 2-5, which shows generating an intermediate representation from the source code, and column 6, lines 23-27, which further shows generating the intermediate representation in terms of a "CodeStore"),

identifying a class-type variable which has a possibility to be executed in parallel (see, for example, column 5, lines 55-58, which shows identifying a variable, and column 6, lines 1-23, which shows an example wherein the variable is a class-type variable).

Nackman further discloses allocating and storing information into a declaration information region in the intermediate representation (see, for example, column 7, lines 43-55) in addition to a region for the implementations (see, for example, column 7, lines 56-59), but does not expressly disclose:

allocating a construction and destruction instruction information region in said intermediate language of the class in addition to a region for a construction instruction routine and a region for a destruction instruction routine;

storing into said construction and destruction information region, information concerning said construction instruction routine and said destruction instruction routine of an object of the class.

However, classes in an object-oriented program, as Nackman discloses (see, for example, column 1, lines 10-31), are known in the art to include constructors and destructors (i.e.,

construction instruction routines and destruction instruction routines, respectively), which are inherently represented in the intermediate representation.

Moreover, Meyer, in an analogous art, discloses allocating a method information region and storing into the method information region, information concerning the constructors and destructors of the classes (see, for example, column 10, lines 36-59). The information is used during compilation to adapt an object-oriented program for distribution over a plurality of processes (see, for example, column 5, lines 28-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allocate a construction and destruction instruction information region in said intermediate language of the class in addition to a region for a construction instruction routine and a region for a destruction instruction routine, and to store into said construction and destruction information region, information concerning said construction instruction routine and said destruction instruction routine of an object of the class, as Meyer suggests, so as to enable Nackman to adapt the program for distribution over a plurality of processes.

Nackman in view of Meyer further discloses:

during generating object codes (see, for example, column 4, lines 5-11, which shows generating object code from the intermediate representation, and column 15, lines 42-50, which further shows generating the object code from the information in the "CodeStore").

Nackman in view of Meyer further discloses detecting that class-type variables are contained in execution statements to be distributed and executed over a plurality of processes (see, for example, Meyer, column 5, lines 28-48) or that class-type variables are specified to be

distributed and executed over a plurality of processes (see, for example, Meyer, column 6, lines 1-10), but does not expressly disclose:

detecting that a certain class-type variable is contained in an execution statement to be executed in parallel or a certain class-type variable is specified in a parallelization directive as a class to be parallelized.

However, in an analogous art, Martin discloses a compiler for a distributed object system (see, for example, the abstract), and discloses source code that includes class-type variables and comments (see, for example, column 7, lines 34-39). The comments are specifications for parallelization, and are thus parallelization directives for classes to be parallelized (see, for example, column 7, line 50 to column 8, line 5, and column 8, lines 54-63). When detecting that a certain class-type variable is to be parallelized and executed in parallel, the system generates constructor code to instantiate a number of copies of the same object in addition to the original object (see, for example, column 9, lines 44-54), so as to ensure high availability of the object (see, for example, column 9, lines 35-38).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement Nackman in view of Meyer with the parallelization features of Martin, so as to enable Nackman in view of Meyer to compile the program for parallel execution and thus ensure high availability, such as Martin teaches.

Nackman in view of Meyer in view of Martin further discloses:

generating an instruction to call said construction instruction routine for an object of the class upon the detection, before said execution statement to be executed in parallel or an execution statement to be parallelized by said parallelization directive, by using said intermediate

language including said information stored in said construction and destruction instruction information region, in order to generate said object in addition to an original object of the class (see, for example, Meyer, column 10, lines 14-35, which shows generating an "SX_NEW" instruction to call an instantiation or construction instruction routine for objects of the class, and see, for example, Martin, column 9, lines 44-54, which further shows that a number of copies of the object are instantiated in addition to the original object of the class); and

generating an instruction to call said destruction instruction routine for the generated object of the class upon the detection, after said execution statement to be executed in parallel or said execution statement to be parallelized by said parallelization directive, by using said intermediate language including said information stored in said construction and destruction instruction information region, in order to destruct the generated object in addition to said original object of the class (see, for example, Meyer, column 10, lines 14-35, which shows generating an "SX_DELETE" instruction to call a deletion or destruction instruction routine for objects of the class, and see, for example, Martin, column 9, lines 44-54, which further shows that a number of copies of the object were instantiated and thus destructed in addition to the original object of the class).

Note that during the generation of object code in Nackman, instructions are generated based on the intermediate representation, which in view of Meyer, includes the information stored in the construction and destruction information region, as presented above.

With respect to claim 3 (currently amended), the rejection of claim 1 is incorporated, and Nackman in view of Meyer in view of Martin further discloses the limitation wherein said construction and destruction instruction information region is linked from a type information

region storing a construction and destruction instruction information region index, and said type information region is linked from a class information region storing a type information region index (see, for example, Nackman, column 8, lines 8-20, which shows that every information region in the intermediate representation is linked in the form of a graph), and when a class is identified, an access is performed from said class information region to said construction and destruction instruction information region via said type information region (note that such an access is inherently performed to reach the appropriate information region).

With respect to claims 5 (currently amended) and 6 (previously presented), the claims are directed to an apparatus that corresponds to the compiler recited in claim 1 (see the rejection of claim 1 above). Note that Nackman in view of Meyer in view of Martin teaches in the apparatus a first generator, a second generator, an allocator and a storing unit, such as in the manner presented above.

With respect to claim 7 (previously presented), the limitations recited in the claim correspond to those of claim 3 (see the rejection of claim 3 above).

With respect to claims 9 (currently amended) and 10 (previously presented), the claims are directed to a method that corresponds to the compiler recited in claim 1 (see the rejection of claim 1 above).

With respect to claim 11 (previously presented), the limitations recited in the claim correspond to those of claim 3 (see the rejection of claim 3 above).

7. Claims 4, 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nackman in view of Meyer in view of Martin, as applied to claims 1, 5 and 9 above, respectively, and further in view of U.S. Patent No. 5,452,461 to Umekita et al. (art of record, "Umekita").

With respect to claim 4 (original), the rejection of claim 1 is incorporated. Nackman in view of Meyer in view of Martin does not expressly disclose the limitation wherein said compiler is a compiler for a parallel computer with shared memory.

However, Umekita discloses a compiler for a parallel computer with shared memory (see, for example, parallel compiler 213 in FIG. 27, and column 5, lines 30-37, which shows a computer having a plurality of processors and shared memory), for parallelizing a source program for execution in parallel with high efficiency (see, for example, column 1, lines 41-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the system of Nackman in view of Meyer in view of Martin in a parallel computer with shared memory, such as taught by Umekita, so as to achieve high efficiency.

With respect to claims 8 (previously presented) and 12 (original), the limitations recited in each claim correspond to those of claim 4 (see the rejection of claim 4 above).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Yigdall whose telephone number is (571) 272-3707. The examiner can normally be reached on Monday through Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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